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EXAMINER

UNDERDAHL, THANE E

ART UNIT	PAPER NUMBER
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1651

NOTIFICATION DATE	DELIVERY MODE
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11/14/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/069,006	Applicant(s) FREDRIKSSON ET AL.	
	Examiner THANE UNDERDAHL	Art Unit 1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 16 April 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7, 9-13, 16 and 18-22 is/are pending in the application.
- 4a) Of the above claim(s) 11 and 20 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 7, 9, 10, 12, 13, 16, 18, 19, 21, 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Detailed Action

This Office Action is in response to the Applicant's reply received 4/16/08. Claims 1-4, 7, 9-13, 16, and 18-22 are pending. Claims 11 and 20 are withdrawn. Claims 5-6, 8, 14, 15, 17 are cancelled. Claims 1-4, 9, 10, 12, 13, 16, 18, and 19 have been amended. Claims 21 and 22 are new.

Response to Applicant's Arguments

In the response submitted by the Applicant the 35 U.S.C § 102 (b) rejection of claims 1, 4, 7 and 10 and the 35 U.S.C § 103(a) rejection of claims 1-4, 7, 9, 10, 12, 13, 16-19 all based on Chang are withdrawn in light of Applicant's amendments that further define the magnetically susceptible particles as iron-containing crystals. Also the 35 U.S.C § 112 rejection of claim 1-4, 7, 9, 10, 12, 13, 16-19 is withdrawn in light of the Applicant's amendments which remove the phrase "temporary" from claim 1 and "specific" from claim 9.

New Rejections Necessitated by Amendment

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 4, 7, 10, and 21 rejected under 35 U.S.C. 102(b) as being anticipated by Kuehnle et al. (U.S. Patent # 5516670).

These claims are to a method of introducing exogenic bioparticles into membrane-envelope structures comprising the following steps:

- Preparing a sample comprising biological membrane-enveloped structures (**BMES**), magnetically susceptible particles (**MSP**) and exogenic bioparticles such DNA molecules, RNA molecules, proteins, peptides, other biopolymers.
- Applying a magnetic alternating field to said sample which increases the kinetic energy of said MSP to form pores in the biological membrane-enveloped structures.
- The pores allow the introduction of exogenic bioparticles into said BMES.
- The BMES are selected from the group consisting of cells, bacteria, virus particles, organelles at the subcellular level and the MSPs comprise magnetically iron-containing crystals.

The claims further limit that the magnetic field is non-homogeneous and has an alternating gradient field direction.

Kuehnle et al. teach a method of using iron particles made from hematite that are inherently magnetic (col 7, lines 32-45). These particles are exposed to an alternating magnetic field (col 7, lines 10-15 and Example 4) that is non-homogeneous (Kuehnle et al. uses the term nonuniform, see Abstract). Also Kuehnle et al. teach that these BMES can be exposed to an RF field to heat the surrounding tissue via the rise in kinetic energy from the oscillating field. (col 7, lines 20-25). These particles can be used to deliver plasmid DNA to the cell

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nucleus (col 6, lines 35-40 and Example 1). Delivering plasmid DNA to the cell nucleus will inherently modify the genetic code of the BMES. Therefore the reference anticipates claims 1, 4, 7, 10, and 21.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4, 7, 9, 10, 12, 13, 16, 18, 19, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kuehnle et al. as applied to claims 1, 4, 7, 10 and 21 above and for the following rational and in light of support of Hernandez et al. (J. Basic Microbiology 35 (1) 1995, pgs 41-46).

The descriptions of claims 1, 4, 7, 10 and 21 are recited in the 35 U.S.C § 102/103 rejection above and are applied here as well. Claims 2, 3, and 12 limit the frequency of the magnetic field to 1-5 MHz and the field strength to 1mT. Claims 9 and 18 limit that the method is for lysis of the BMES. Claims 13, 16, 18, 19 and 22 reiterate the limitations of claims 4, 7, 9, 10 and 21 but depend from claim 2.

While the references listed above do not specifically teach these specific numbers for field strength and frequency as seen in claims 2, 3, and 12, one of ordinary skill in the art would recognize these limitations are result effective variables. Indeed Kuehnle et al. teach that the field strength can be controlled by a potentiometer (col 5,

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lines 21-21) and the frequency can be adjusted as well (Examples 4 and 5). Absent any teaching of criticality by the Applicant concerning these limitations, it would be *prima facie* obvious that one of ordinary skill in the art would recognize these limitations are result effective variables which can be met as a matter of routine optimization (M.P.E.P. § 2144.05 II).

Claims 13, 16, 18, 19 and 22 reiterate the limitations of claims 4, 7, 9, 10 and 21 but depend from claim 2. Since claim 2 has been shown obvious above, claims 13, 16, 18, 19 and 22 are also obvious since their limitations were taught in the previous 102(b) rejection and are applied to claim 2 as well since the only point not anticipated by Kuehnle et al. of claim 2 is the frequency of the magnetic field.

Since Kuehnle et al. teach a method of heating cells using the oscillating motion of the MSPs (col 7 lines 10-15) and that the intensity of the magnetic field can be increased (col 5 lines 19-21) then it would be obvious to use the method of Kuehnle et al. to lyse cells since the simple step of heating cells for lysis is well known in the art as supported by Hernandez et al. (See Abstract).

Therefore this reference renders obvious claims 1-4, 7, 9, 10, 12, 13, 16, 18, 19, 21 and 22.

Claims 1-4, 7, 9, 10, 12, 13, 16, 18, 19, 21 and 22 rejected under 35 U.S.C. 103(a) as being unpatentable over Pope et al. (Nucleic Acids Research, 1996) in view of Jordan et al. (Int. J. Hyperthermia, 1993).

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The descriptions of these claims are recited in the 35 U.S.C § 102 and 103 rejection in view of Kuehnle et al.

Pope et al. teach a method of transforming *E. coli* with plasmid DNA using an improved heat shock method at 42 °C (Pope, pg 536, col 1, 3rd paragraph). What Pope does not teach is that the *E. Coli* are heated with MSPs. However it would be obvious to one of ordinary skill in the art to use MSP heating to shock the cells in view of teachings of Jordan et al. They teach that inductive heating of ferrimagnetic particles such as ferrite crystals in alternating magnetic fields such as RF fields can improve temperature distributions in critical regions (see Abstract). Jordan et al. teach that their ferromagnetic particles can achieve temperatures in the cellular compositions between 25-50 °C (page 55, section 2.1). They also teach that their magnetic fields have a frequency of 300 kHz to 80 MHz which encompasses the range of the current application and thus renders it obvious (M.P.E.P. § 214.05 I). One of ordinary skill in the art would recognize that an improved method of temperature distribution would improve a heat shock method since it is the rise in temperature that increases the permeability of the cell membrane. One of ordinary skill in the art would recognize that this is simply applying a known technique for heating cellular compositions to a known method such as heat shock (KSR International v. Teleflex Inc. 550 U.S. ___, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007)). Also one of ordinary skill in the art would recognize that that using the magnetic particles to heat a cellular composition instead of the warm water in the traditional heat shock method is simply substituting one method of heating the cellular composition for another and that having an internal uniform distribution of

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temperature increase instead of a the non-uniform increase when plunging the vial containing the cells into warm water would be using this known technique to improve heat shock methods (KSR International v. Teleflex Inc. 550 U.S. ___, 127 S. Ct. 1727, 82 U.S.P.Q.2d 1385 (2007)).

While the references listed above do not specifically teach the limitations of the intensity of the magnetic field, one of ordinary skill in the art would recognize these limitations are result effective variables as shown in the formulas of Jordon et al. (pg 52, Formulas 1, 2 and 3). Absent any teaching of criticality by the applicant concerning this intensity, it would be *prima facie* obvious that one of ordinary skill in the art would recognize these limitations are result effective variables which can be met as a matter of routine optimization (M.P.E.P. § 2144.05 II).

Therefore these references render obvious claims 1-4, 7, 9, 10, 12, 13, 16, 18, 19, 21 and 22.

No claims are currently allowed in this application.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

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shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

In response to this office action the applicant should specifically point out the support for any amendments made to the disclosure, including the claims (MPEP 714.02 and 2163.06). Due to the procedure outlined in MPEP § 2163.06 for interpreting claims, it is noted that other art may be applicable under 35 U.S.C. § 102 or 35 U.S.C. § 103(a) once the aforementioned issue(s) is/are addressed.

Applicant is requested to provide a list of all copending U.S. applications that set forth similar subject matter to the present claims. A copy of such copending claims is requested in response to this Office action.

CONTACT INFORMATION

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thane Underdahl whose telephone number is (571) 272-9042. The examiner can normally be reached Monday through Thursday, 8:00 to 17:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Wityshyn can be reached at (571) 272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Thane Underdahl
Art Unit 1651

/Leon B Lankford/
Primary Examiner, Art Unit 1651